CLAIMS

WHAT IS CLAIMED IS:

1. A method of ventilating an enclosed space using an air handling system including an isolating heat exchanger for conducting exhaust air form said enclosed space and outside air into said enclosed space and exchanging heat between said exhaust air and said outside air while isolating the flows of said outside and exhaust air form one another, a first fan to move said exhaust air through said heat exchanger, a second fan to move said outside air through said heat exchanger, said first fan being located downstream from said heat exchanger in the flow path of said exhaust air for pulling said exhaust air out of said heat exchanger, the steps of:

(a) evporatively cooling said exhaust air at a cooling location upstream of said heat exchanger in said flow path of said exhaust air, and

(b) creating a substantial air pressure drop between said first fan and said cooling location to augment said evaporative cooling.

2. A method as in Claim 1 in which said creating step includes providing a restriction to the flow of said exhaust air through said heat exchanger.

3. A method as in Claim 2 in which said restriction comprises a member made of porous material at least partially blocking the flow of said exhaust air into said heat exchanger, said evaporative cooling step including supplying water to said member.

4. A method as in Claim 1 in which said second fan is used to force said outside air into said heat exchanger.

5. A method as in Claim 2 in which said restriction comprises a damper selectively operable to restrict the flow path for exhaust air entering said heat exchanger.

6. A ventilator for ventilating an enclosed space, said ventilator including:

(a) an isolating heat exchanger for conducting exhaust air from said enclosed space and outside air into said enclosed space, and exchanging heat between said outside air and said exhaust air while isolating the flow of said exhaust air and said outside air from one another,

(b) a first fan to move said exhaust air through said heat exchanger in a first direction, and

(c) a second fan to move said outside air through said heat exchanger in a direction generally opposite to said first direction,

(d) said first fan being a suction fan located downstream from said heat exchanger and being oriented to pull air through said heat exchanger,

(e) a flow restrictor positioned to restrict flow or exhaust air through said heat exchanger and produce a substantial pressure reduction in exhaust air flowing through said heat exchanger, and

(f) an evaporative cooling device for evaporatively cooling said exhaust air flowing through said heat exchanger.

7. A ventilator as in Claim 6 in which said flow restrictor is selected from the group consisting of an adjustable damper and a water evaporation mat positioned to at least partially restrict the flow of said exhaust air into said heat exchanger, said mat being part of said evaporative cooling device.

8. A ventilator as in Claim 6 in which said evaporative cooling device includes a water sprayer for spraying water into said exhaust air before it enters said heat exchanger.

9. A ventilator as in Claim 6 in which the air conduit surfaces of said heat exchanger are made essentially of thermoplastic material.

10. A ventilator for ventilating an enclosed space, said ventilator including:

(a) an isolating heat exchanger for conducting exhaust air from said enclosed space and outside air into said enclosed space, and exchanging heat between said outside air and said exhaust air while isolating the flow of said exhaust air and said outside air from one another,

(b) a first fan to move said exhaust air through said heat exchanger in one direction, and

(c) a second fan to move said outside air through said heat exchanger in a direction transverse to said first direction,

(d) said first fan being a suction fan located downstream from said heat exchanger and being oriented to pull air through said heat exchanger, said second fan being positioned upstream from said heat exchanger and being oriented to push said outside air through said heat exchanger.

11. A ventilator as in Claim 10 including a flow restrictor positioned to restrict the flow of exhaust air thorough said heat exchanger and produce a substantial pressure reduction in said exhaust air flowing.

12. A method of making a plastic heat exchanger for transferring heat from one gas to another while maintaining a barrier between them to isolate one gas from the other,

providing a plurality of panels of plastic material, each having a substantial thickness, and two opposed broad surfaces,

pressure-forming at least one broad surface of selected ones of said panels to form at least one gas passage cavity in each,

providing the others of said panels with elongated gas flow passages,

interleaving said selected sheets with said others of said panels in a predetermined sequence, and

securing said panels together with broad surfaces thereof contacting one another,

said gas passage cavities, together with surfaces of adjacent panels, forming conduits for one of said gases, and said elongated gas flow passages forming conduits for the other of said gases.

13. A method as in Claim 12 in which each of said gas flow cavities includes a mid-section and two end sections, the gas flow passages provided in each of said end sections extending away from said mid-section at a substantial angle.

14. A method as in Claim 12 in which said pressure-forming step includes leaving selected areas of the sheet unaffected in height to form gas flow vanes.

15. A method as in Claim 12 in which said panels are made of thermoplastic material, and including the step of heating the broad surface of at least one of said panels to soften the plastic material on said broad surface, and pressing another of said panels against said surface to secure said sheets together.

16. A method as in Claim 12 in which said panels are made of thermoplastic material, and including the step of heat-rolling the edges of said panels after assembly to melt plastic material to form a thick plastic wall for the assembly.

17. A method as in Claim 16 including the step of heat-singeing the adjacent ends of gas flow conduits in said panels to weld the conduit ends together.

18. A method as in Claim 12 in which said panels are made of thermoplastic material and said pressure-forming step includes the use of heat, and in which at least said other panels each comprise a plurality of elongated tubes secured together to form a panel.

19. A method as in Claim 12 in which said predetermined sequence is one in which said selected panels alternate with said other panels.

20. A method as in Claim 12 in which said panels are selected from the group consisting of expanded plastic panels and sheets formed of elongated plastic tubes.

21. A method as in Claim 12 in which said forming step comprises forming gas flow cavities in both of said broad surfaces.

22. A method as in Claim 12 including the step of forming gas flow cavities in at least one of said broad surfaces of said other sheets as well as said selected panels.

23. A heat exchanger comprising, in combination,

a plurality of panels of thermoplastic material, each of said panels having two opposed broad surfaces and at lest one edge, each of said broad surfaces having a greater surface area than said edge,

selected ones of said panels having at least one indentation in at least one of said broad surfaces, said indentation forming a gas flow passage cavity,

other of said panels each having at least one gas flow conduit structure forming at least one gas flow conduit,

said selected ones of said panels being interleaved with said others of said panels in a predetermined sequence,

said panels being assembled with said broad surfaces of said sheets joined together so that said gas flow cavity in each of said selected sheets forms a gas flow passageway with one of said broad surfaces of an adjoining one of said other panels.

24. A heat-exchanger as in Claim 23 in which each of said gas flow cavities includes a mid-section and two end sections, the gas flow passage provided in each of said end sections extending away from said mid-section of a substantial angle.

25. A heat-exchanger as in Claim 23 in which said edges of said panels are aligned with one another and fused together to form at least one solid outside wall for said heat exchanger.

26. A heat-exchanger as in Claim 23 in which the edges of the ends of said gas flow passages are fused together with said gas flow passages open.

27. A heat-exchanger as in Claim 23 in which at least said other panels each comprise a plurality of elongated tubes secured together to form said panel.

28. A heat-exchanger as in Claim 23 in which said panels are selected from the group consisting of expanded plastic panels and panels formed of elongated plastic tubes.

29. A heat-exchanger as in Claim 23 including indentations in both of said broad surfaces of each of said selected ones of said panels to form gas flow cavities in each of said surfaces.

30. A heat-exchanger as in Claim 23 in which said gas flow conduit structure in each of said other panels is selected from the group consisting of a plurality of side-by-side

thermoplastic tubes and at least one indentation forming a gas flow cavity in at least one of said broad surfaces.

31. A heat-exchanger as in Claim 23 in which said gas flow passageways in said selected sheets and gas flow conduits in said other sheets are positioned to conduct gases in substantially opposite directions over a substantial portion of their lengths.